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WHAT IS CLAIMED IS:

2	1. An isolated nucleic acid molecule selected from the group consisting of:
3	a) a nucleic acid molecule having a nucleotide sequence which is at least 90% identical to
4	the nucleotide sequence of Chlamydomonas intraflagellar transport (IFT) particle protein gene
5	20, 27, 46, 52, 57, 72, 88, 122, 139, or Che-2, or a complement thereof;
6	b) a nucleic acid molecule comprising at least 15 nucleotide residues and having a
7	nucleotide sequence identical to at least 15 consecutive nucleotide residues of the nucleotide
8	sequence of Chlamydomonas IFT particle protein gene 20, 27, 46, 52, 57, 72, 88, 122, or 139, or
9	Che-2, or a complement thereof;
10	c) a nucleic acid molecule which encodes a polypeptide comprising the amino acid
11	sequence of Chlamydomonas IFT particle protein 20, 27, 46, 52, 57, 72, 88, 122, 139, or Che-2;
12	or
13	d) a nucleic acid molecule which encodes a polypeptide comprising at least 10 amino
14	acids and having an amino acid sequence identical to at least 10 consecutive amino acids of the
15	amino acid sequence of Chlamydomonas IFT particle protein 20, 27, 46, 52, 57, 72, 88, 122,
16	139, or Che-2.
17	
18	2. The isolated nucleic acid molecule of claim 1, which is selected from the group
19	consisting of:
20	a) a nucleic acid having the nucleotide sequence of Chlamydomonas IFT particle protein
21	gene 20, 27, 46, 52, 57, 72, 88, 122, 139, or Che-2, or a complement thereof; and
22	b) a nucleic acid molecule which encodes a polypeptide having the amino acid sequence
23	of Chlamydomonas IFT particle protein 20, 27, 46, 52, 57, 72, 88, 122, 139, or Che-2.
24	
25	3. The nucleic acid molecule of claim 1, further comprising nucleic acid sequences
26	encoding a heterologous polypeptide.
27	
28	4. A vector comprising the nucleic acid molecule of claim 1.
29	
30	5. A host cell comprising the nucleic acid molecule of claim 1.

complement thereof;

	32	6. The host cell of claim 5, wherein the host cell is a non-human mammalian host cell.
	33	
	34	7. An isolated polypeptide selected from the group consisting of:
	35	a) a polypeptide comprising at least 10 amino acids and having an amino acid sequence
	36	identical to at least 10 consecutive amino acids of the amino acid sequence of Chlamydomonas
	37	intraflagellar transport (IFT) particle protein 20, 27, 46, 52, 57, 72, 88, 122, 139, or Che-2;
	38	b) a polypeptide comprising the amino acid sequence of Chlamydomonas IFT particle
	39	protein 20, 27, 46, 52, 57, 72, 88, 122, 139, or Che-2, wherein the polypeptide comprises one or
	40	more conservative amino acid substitutions that do not inhibit the biological activity of the
	41	polypeptide relative to a corresponding native Chlamydomonas IFT particle protein; and
===	42	c) a polypeptide which is encoded by a nucleic acid molecule comprising a nucleotide
1 T	43	sequence which is at least 90% identical to a nucleic acid consisting of the nucleotide sequence
The first ton that the first first first first	44	of Chlamydomonas IFT particle protein gene 20, 27, 46, 52, 57, 72, 88, 122, 139, or Che-2, or a
	45	complement thereof.
W.	46	
ŧ	47	8. The isolated polypeptide of claim 7, comprising the amino acid sequence of
The first than the fi	48	Chlamydomonas IFT particle protein 20, 27, 46, 52, 57, 72, 88, 122, 139, or Che-2.
	49	
# " # " # # # # # # # # # # # # # # # #	50	9. The polypeptide of claim 7, wherein the polypeptide further comprises heterologous
	51	amino acid residues.
	52	
	53	10. An antibody that selectively binds to the polypeptide of claim 7.
	54	
	55	11. An antibody that selectively binds to the polypeptide of claim 8.
	56	
	57	12. An isolated nucleic acid molecule selected from the group consisting of:
	58	a) a nucleic acid molecule having a nucleotide sequence which is at least 90% identical to
	59	the nucleotide sequence of mouse intraflagellar transport (IFT) particle protein gene 57, or a

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- b) a nucleic acid molecule comprising at least 15 nucleotide residues and having a nucleotide sequence identical to at least 15 consecutive nucleotide residues of the nucleotide sequence of mouse IFT particle protein gene 57, or a complement thereof;
- c) a nucleic acid molecule which encodes a polypeptide comprising the amino acid sequence of mouse IFT particle protein 57; or
- d) a nucleic acid molecule which encodes a polypeptide comprising at least 10 amino acids and having an amino acid sequence identical to at least 10 consecutive amino acids of the amino acid sequence of mouse IFT particle protein 57.
- 13. The isolated nucleic acid molecule of claim 12, which is selected from the group consisting of:
- a) a nucleic acid having the nucleotide sequence of mouse IFT particle protein gene 57 or a complement thereof; and
- b) a nucleic acid molecule which encodes a polypeptide having the amino acid sequence of mouse IFT particle protein 57.
 - 14. An isolated polypeptide selected from the group consisting of:
- a) a polypeptide comprising at least 10 amino acids and having an amino acid sequence identical to at least 10 consecutive amino acids of the amino acid sequence of mouse intraflagellar transport (IFT) particle protein 57;
- b) a polypeptide comprising the amino acid sequence of mouse IFT particle protein 57, wherein the polypeptide comprises one or more conservative amino acid substitutions that do not inhibit the biological activity of the polypeptide relative to native mouse IFT particle protein 57; and
- c) a polypeptide which is encoded by a nucleic acid molecule comprising a nucleotide sequence which is at least 90% identical to a nucleic acid consisting of the nucleotide sequence of mouse IFT particle protein gene 57, or a complement thereof.
- 15. The isolated polypeptide of claim 14, comprising the amino acid sequence of mouse IFT particle protein 57.

92	16. A method for identifying a candidate compound that modulates the activity of mouse
93	intraflagellar transport (IFT) particle protein 57, the method comprising:
94	contacting a test compound to an isolated IFT particle polypeptide of claim 14; and
95	determining whether the test compound interacts with the polypeptide, wherein
96	interaction indicates that the test compound is a candidate modulator of mouse IFT particle
97	protein 57.
98	
99	17. A method for identifying a candidate compound that modulates the activity of a
100	human intraflagellar transport (IFT) particle protein, the method comprising:
101	contacting a test compound to an isolated IFT particle polypeptide; and
102	determining whether the test compound interacts with the polypeptide, wherein
_ 103	interaction indicates that the test compound is a candidate modulator of a human IFT particle
104	protein.
104 105	
106	18. The method of claim 17, wherein the isolated human IFT particle polypeptide is
107	selected from the group consisting of human IFT particle polypeptide 20-1, 20-2, 20-3, 27, 46,
	52, 57-1, 57-2, 72, 88, 122, 139-1, 139-2 and Che-2.
108 1109	
1110	19. The method of claim 17, wherein the test compound binds to the isolated IFT particle
111 112	polypeptide and wherein the modulation is inhibition of activity.
112	
113	20. The method of claim 17, wherein the test compound binds to the isolated IFT particle
114	polypeptide and wherein the modulation is increasing activity.
115	
116	21. The method of claim 17, further comprising
117	contacting the candidate modulator to a culture of cells comprising functional cilia, and
118	determining whether the candidate modulator inhibits cilia function, wherein inhibition of
119	cilia function indicates the candidate modulator is an IFT particle protein inhibitory agent.
120	
121	22. The method of claim 17, further comprising

122	contacting the candidate modulator to a culture of cells comprising non-functional cilia
123	and lacking a specific IFT particle protein, and
124	determining whether the candidate modulator restores cilia function, wherein restoration
125	of cilia function indicates the candidate modulator is an IFT particle protein restorative agent.
126	
127	23. A method for identifying a candidate compound that restores the activity of a
128	defective or absent human intraflagellar transport (IFT) particle protein, the method comprising:
129	obtaining a mixture of isolated IFT particle polypeptides that comprises (i) all but one of
130	the IFT particle polypeptides required to form the IFT particle, and (ii) a medium that enables the
131	IFT particle polypeptides to form the IFT particle when all normal IFT particle polypeptides that
132	constitue that IFT particle are present;
1 33	contacting a test compound to the mixture; and
1 134	determining whether the test compound enables the IFT particle to be formed, wherein
135	IFT particle formation indicates the test compound is a candidate compound that restores the
136	activity of a defective or absent human IFT particle protein.
137	
138 2	24. The method of claim 23, further comprising
139 140 141	contacting the candidate compound to a culture of cells comprising non-functional cilia
140	and lacking a specific IFT particle protein, and
1 41	determining whether the candidate compound restores cilia function, wherein restoration
142	of cilia function indicates the candidate compound is an IFT particle protein restorative agent.
143	
144	25. The method of claim 23, wherein the human IFT particle polypeptide is selected
145	from the group consisting of human IFT particle polypeptides 20-1, 20-2, 20-3, 27, 46, 52, 57-1,
146	57-2, 72, 88, 122, 139-1, 139-2 and Che-2.
147	
148	26. A method of diagnosing a disorder in a tissue in a subject caused by a defective or
149	absent human intraflagellar transport (IFT) particle protein, the method comprising
150	obtaining a sample of cells from the tissue;
151	disrupting the cells;

contacting the disrupted cell sample with an antibody that specifically binds to a normal 152 human IFT particle protein; and 153 detecting binding of the antibody to any IFT particle protein in the sample, wherein 154 absence of binding indicates that the tissue has a disorder caused by a defective or absent IFT 155 particle protein. 156 157 27. The method of claim 26, wherein the disorder is kidney disease, retinal disorder, 158 thyroid disorder, chondrocyte disease, olfactory disease, azoospermia, or primary ciliary 159 dyskinesia. 160 161 28. A method of treating a disorder in a subject caused by a defective or absent 162 **1**63 intraflagellar transport (IFT) protein, the method comprising administering to the subject a human IFT particle polypeptide in an amount effective to restore the function of the defective or 165 absent IFT particle protein. 166 1167 29. The method of claim 28, wherein administering the human IFT particle polypeptide 168 comprises administering a nucleic acid that encodes a human IFT particle polyptide. 1169 1 170 30. The method of claim 28, wherein the human IFT particle polypeptide is selected 크₇₁ from the group consisting of human IFT particle polypeptides 20-1, 20-2, 20-3, 27, 46, 52, 57-1, 57-2, 72, 88, 122, 139-1, 139-2 and Che-2. 172 173 31. A method of treating an infection in a subject caused by a pathogen that comprises a 174 intraflagellar transport (IFT) particle protein, the method comprising administering to the subject 175 an effective amount of an agent that inhibits the function of the IFT particle protein. 176 177 32. The method of claim 31, wherein the agent is an antibody that binds specifically to 178 the IFT particle protein. 179 180

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33. The method of claim 31, wherein the subject is a mammal.

183	34. The method of claim 31, wherein the subject is a human.	
184		
185	35. The method of claim 31, wherein the subject is a plant.	
186		
187	36. The method of claim 31, wherein the pathogen is a nematode, insect, prot	ozoa
188	pacteria.	
189		